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How to Build and Use a Light Table Camera Mount

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A camera mount was assembled to fit a light table stereoscope bridge. The mount allows various camera-lens combinations to be used for copying aerial photos or other remotely sensed imagery from the light table. The cost of assembly was less than $20 and 1 hour labor.

Keywords: Photographic equipment, remote sensing.

It is often necessary to copy aerial photos and other remotely sensed imagery for special uses. These uses include scale modification, slide talks, manuscript illustrations, training aids, and duplication of original material. The copying process usually involves rephotographing a specific portion of a 9- by 9-inch or 70-mm format transparency onto a smaller format such as 35-mm transparencies or negatives. The copying process can be performed by commercial photo labs, but the process is time consuming, expensive, and direct control over the quality and area copied is lacking.

Hand held or tripod mounted cameras are unsteady or awkward, and the copy photos are usually not sharply focused and not properly aligned. The camera copy mount described here eliminates those problems, is inexpensive, allows maximum area and format selection, is easy to construct, and is used directly on a light table.

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Design and Assembly

The camera mount described is designed to fit a Richards 918 LW light table stereoscope bridge (fig. 1).[2] It can be adapted to fit most light tables with similar features.

[2]*Trade names and company names are used for the benefit of the reader, and do not imply endorsement or preferential treatment by the U.S. Department of Agriculture.*

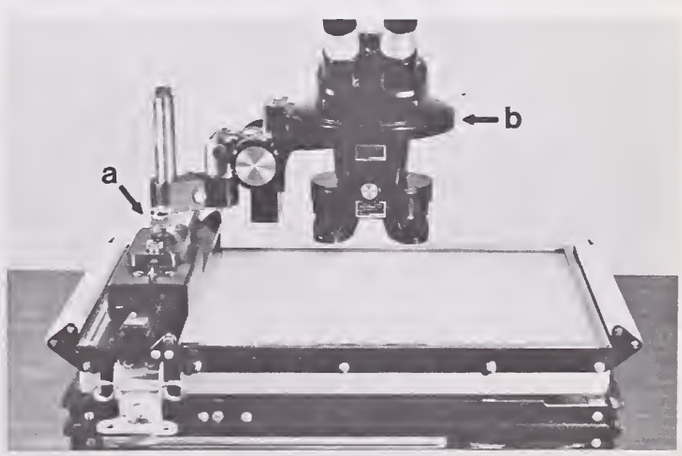

Figure 1.—Light table with stereoscope bridge (a) and stereoscope (b) in place.

The mount was constructed by inserting a 5/8-inch-diameter by 12-inch-long cold-rolled steel rod into the clamp link of the bridge assembly which normally accepts the stereoscope (fig. 2). A 1/8-inch-diameter hole was drilled through the center of the rod 3 inches from one end. A cotter pin was inserted into the 1/8-inch hole and used as a stop against the clamp link. The cotter pin stop eliminates the rod from sliding through the clamp link far enough to strike the glass surface of the light table.

A sliding binocular support was clamped to the 5/8-inch rod. This support can be placed at any desired height. The clamp link which holds the rod can also be adjusted to different camera heights and angles on the stereoscope carriage assembly post.

A 1/4-inch by 20-thread by 5/8-inch stud inserted permanently in a ball and socket head (fig. 2) results in a head connector that will mount most cameras. The ball and socket was then attached to the sliding binocular support to complete the camera mount. Vertical adjustment of the camera on the rod and horizontal movement of the stereoscope bridge on the light table provides camera-to-subject alignment. The apparatus was assembled in 1 hour at a cost of less than $20. Parts were purchased from local hardware and photographic stores.

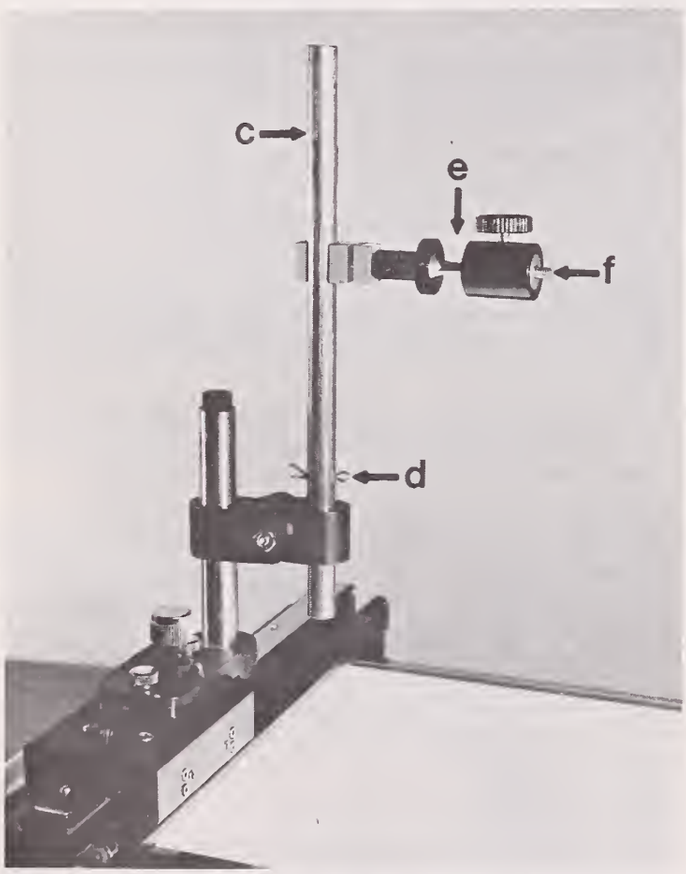

Figure 2.—Stereoscope replaced with camera mount which includes: steel rod camera support (c), cotter pin stop (d), camera ball and socket head (e), and camera attachment stud (f).

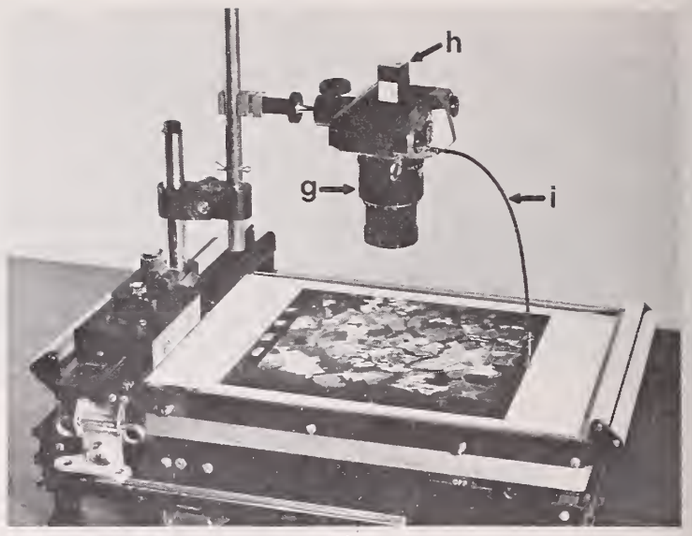

Figure 3.—A 35-mm camera with macro lens (g) attached to the light table camera mount; note level bubble (h) and shutter release cable (i). Image on the light table is a 9- by 9-inch transparency.

Application and Discussion

The camera mount and light table can be used to copy single or spooled transparencies. Using the proper camera-lens combination, 35-mm to 9- by 9-inch formats can be copied (fig. 3). Entire frames or specific portions of frames may be copied on appropriate format films.

Best results have been obtained by using a light table that approximates mean daylight (5,000° K) and color film rated accordingly. This is especially critical when copying color or color infrared originals. Using this light source and copy film combination, the camera mount provided color copies with minimal color shifts. Color may shift when copying extremely dense originals which require copy camera shutter speeds slower than 1/15 second. To avoid imaging the light table fluorescent tubes, camera shutter speed should not be faster than 1/30 of a second. The use of a shutter release cable adds to the sharpness of the copy photos by minimizing camera vibrations.

Depth-of-field is critical when copying at close distances. Camera-to-subject alignment affects depth-of-field and edge-to-edge sharpness of the resultant copy photo. Use of a macro lens and a small aperture allows extremely close and sharp copies. The macro lens is a flat-field lens that minimizes edge distortion. A small bubble level on the camera is used to make critical camera alignments to maximize depth-of-field and edge sharpness. A glass plate placed over the photo to be copied keeps it flat and increases photo copy sharpness. Overhead lights should be turned off to eliminate reflections on both the photo and the glass.